

**REMARKS**

Claims 21-41 are pending. Applicants have amended the title to correct a typographical error.

In a telephone conference between Special Programs Examiner Clayton Leballe and Applicants' representative Timothy M. Hsieh, the Patent Office acknowledged that the stamped postcard, a copy of which is attached, evidences the Patent Office's receipt of a Preliminary Amendment, a Transmittal Letter, an Information Disclosure and PTO-1449, and a copy of the cover page of WIPO Publication No. WO 01/08171 A1, all originally filed on January 28, 2002. Because none of those documents appear in the Patent Office's file, Applicants agreed to submit a true copy of those documents.

In a subsequent telephone conference between Examiner Mayo and Applicants' representative Timothy M. Hsieh, Applicants agreed to also provide a true copy of the certified copy of the priority application originally filed in the Patent Office on April 17, 2002, and a copy of the stamped postcard.

To this Amendment, Applicants have attached true copies of:

- 1) the postcard stamped on January 28, 2002 by the Patent Office indicating receipt of the following four (4) items by the PTO;
- 2) the Preliminary Amendment originally filed on January 28, 2002;
- 3) the Transmittal Letter originally filed on January 28, 2002;
- 4) the Information Disclosure and PTO-1449 originally filed on January 28, 2002;
- 5) the cover page of WIPO Publication No. WO 01/08171 A1 originally filed on January 28, 2002;

6) the postcard stamped on April 17, 2002 by the Patent Office indicating receipt of the following item by the PTO;

7) the certified copy of the priority application originally filed on April 17, 2002.

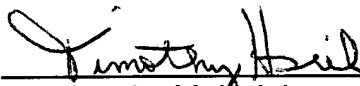
The Preliminary Amendment originally filed on January 28, 2002, canceled claims 1-20 and added new claims 21-41. Because the Office Action examined canceled claims 1-20 rather than new claims 21-41, Applicants request that the Examiner withdraw the Office Action and issue a new Office Action addressing claims 21-41. Applicants also request that the Examiner re-start the period for response as of the date of the new Office Action.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: June 12, 2003

By:   
Timothy M. Hsieh  
Registration No. 42,672



255-457

**PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:**

New U.S. Patent Application

Title: SYSTEM FOR TRANSMITTING ELECTRIC ENERGY IN SUPERCONDUCTIVITY  
CONDITIONS AND METHOD FOR REFRIGERATING IN CONTINUOUS A SUPERCONDUCTING  
CABLE

being a Continuation of PCT International Application No. PCT/EP00/06877, filed July 19, 2000

Inventors: Massimo BECHIS and Marco NASSI

**BOX PATENT APPLICATION**

1. Check for \$1056.00
2. Transmittal Letter
3. Application 29 pages, including 3 independent claims and 22 claims total (as amended).
4. Preliminary Amendment.
5. Drawings 5 sheets of drawings containing 5 figures.
6. Information Disclosure Statement and Information Disclosure Citation, PTO 1449 with documents attached.
7. Copy of cover page of WIPO Publication No. WO 01/08171 A1.

Dated: January 28, 2002

Docket No.: 05788.0207

CUSTOMER NUMBER: 22,852

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(Due Date: 1/26/02)  
Saturday

Dht 1-24-02

1/24/02



PATENT  
Customer No. 22,852  
Attorney Docket No.: 05788.0207

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Continuation of: ) Group Art Unit:  
)  
PCT/EP00/06877 )  
) Examiner:  
Inventor: Massimo BECHIS et al. )  
)  
Serial No.: Not Yet Assigned )  
)  
Filed: January 28, 2002 )  
)  
For: SYSTEM FOR TRANSMITTING )  
ELECTRIC ENERGY IN )  
SUPERCONDUCTIVITY )  
CONDITIONS AND METHOD )  
FOR REFRIGERATING IN )  
CONTINUOUS A )  
SUPERCONDUCTING CABLE )

Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

Sir:

**PRELIMINARY AMENDMENT**

Prior to examination, please amend the above-identified application as follows:

**IN THE SPECIFICATION:**

Please amend the specification as follows:

Page 1, after the title, insert the following new heading and new paragraph as follows:

**--CROSS REFERENCE TO RELATED APPLICATIONS**

This application is a continuation of international application number

PCT/EP00/06877, filed July 19, 2000, the content of which is incorporated herein by

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reference, and claims the priority of European Patent Application No. 99114604.4, filed July 26, 1999, and the benefit of U.S. Provisional Application No. 60/145,838, filed July 27, 1999, the content of which is incorporated herein by reference.--

**IN THE CLAIMS:**

Please cancel now pending claims 1-20 without prejudice or disclaimer and substitute new claims 21-41 therefor as follows:

**WHAT IS CLAIMED IS:**

21. (New) A system for transporting electric energy in superconductivity conditions, comprising:
- a superconducting cable including superconducting material, and
  - a cryogenic plant for cooling said superconducting cable below the critical temperature of said material, comprising:
    - a) a circuit for circulating from and to the superconducting cable a first refrigerating fluid having a first predetermined temperature lower than the critical temperature of the superconducting material,
    - b) a refrigerating circuit for cooling a second refrigerating fluid to a second predetermined temperature lower than the temperature of the first refrigerating fluid, and
    - c) a heat exchange unit for effecting a heat exchange between said first and second refrigerating fluids,
- said heat exchange unit comprising a storage unit of a third refrigerating fluid having a third predetermined temperature lower than the temperature

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of the first refrigerating fluid, said third refrigerating fluid being in heat exchange relationship with said first and second fluids.

22. (New) A system according to claim 21, wherein said storage unit has a predetermined volume adapted to contain a quantity of said third refrigerating fluid corresponding to the thermal consumption of said superconducting cable for at least two hours in the absence of a heat exchange with said second refrigerating fluid.
23. (New) A system according to claim 21, wherein the refrigerating circuit for cooling the second refrigerating fluid comprises at least one refrigerating unit provided with at least one heat exchanger in heat exchange relationship with said storage unit.
24. (New) A system according to claim 21, wherein the refrigerating circuit for cooling the second refrigerating fluid comprises at least one refrigerating unit in heat exchange relationship with the storage unit and with said first fluid, said refrigerating unit being positioned upstream of said superconducting cable and the storage unit being in parallel with said refrigerating unit.
25. (New) A system according to claim 23 or 24, wherein said storage unit comprises a storage tank structurally independent from said refrigerating unit.
26. (New) A system according to claim 21, wherein the heat exchange unit further includes at least one heat exchanger immersed in the third refrigerating fluid stored in said storage unit, said at least one heat

exchanger being provided with a fluid flowpath for the tube-side circulation of said first refrigerating fluid.

27. (New) A system according to claim 21, further comprising an auxiliary circuit for maintaining the third refrigerating fluid at said predetermined temperature.
28. (New) A system according to claim 27, wherein the auxiliary circuit comprises at least one vacuum pump connected to said storage unit by means of ducts, at least one heat exchange unit being interposed between said vacuum pump and said heat exchange unit.
29. (New) A system according to claim 28, wherein the heat exchange unit comprises at least one heat exchanger provided with a fluid flowpath for circulating a gas phase including vapors of said third refrigerating fluid.
30. (New) A system according to claim 21, further comprising a container for storing the third refrigerating fluid, said container being selectively connected to the storage unit of the heat exchange unit by means of at least one duct.
31. (New) A system according to claim 25, further comprising a container for storing the third refrigerating fluid, said container being selectively connected to the storage unit of the heat exchange unit by means of at least one duct.
32. (New) A system according to claim 21, wherein the first refrigerating fluid is liquid nitrogen, and said first predetermined temperature is between 63° and 70°K.

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33. (New) A system according to claim 21, wherein said second refrigerating fluid is gaseous helium having a pressure ranging between 1 and 20 bar, and said second predetermined temperature is between 40° and 50°K.
34. (New) A system according to claim 21, wherein said third refrigerating fluid is subcooled liquid nitrogen, and said third predetermined temperature is between 63° and 69°K.
35. (New) A cryogenic plant for cooling a superconducting cable including a superconducting material below the critical temperature of said superconducting material, comprising:
- a) a circuit for circulating a first refrigerating fluid having a first predetermined temperature from and to the superconducting cable,
  - b) a refrigerating circuit for cooling a second refrigerating fluid to a second predetermined temperature lower than the temperature of the first refrigerating fluid, and
  - c) a heat exchange unit for effecting a heat exchange between said first and second refrigerating fluids,
- said heat exchange unit being provided with a storage unit of a third refrigerating fluid having a third predetermined temperature lower than the temperature of the first refrigerating fluid, said third refrigerating fluid being in heat exchange relationship with said first and second fluids.
36. (New) A cryogenic plant according to claim 35, wherein said storage unit has a predetermined volume adapted to contain a quantity of said third refrigerating fluid at said predetermined temperature, corresponding to the



thermal workload of said refrigerating circuit for a time period of at least two hours in the absence of heat exchange with said second fluid.

37. (New) A cryogenic plant according to claim 36, wherein said storage unit has a volume corresponding to the thermal workload of said refrigerating circuit for a time period of at least twelve hours in the absence of heat exchange with said second fluid.
38. (New) A cryogenic plant according to claim 35, wherein said storage unit has a volume of at least 2000 liters.
39. (New) A cryogenic plant according to claim 25, wherein said storage unit has a volume of at least 12000 liters.
40. (New) A method for continuously cooling a superconducting cable including a superconducting material below the critical temperature of said superconducting material, comprising the steps of:
- a) circulating a first refrigerating fluid from and to the superconducting cable;
  - b) cooling the first refrigerating fluid to a first predetermined temperature by means of a second refrigerating fluid having a second predetermined temperature lower than the temperature of the first refrigerating fluid;  
the cooling step of the first refrigerating fluid being effected by means of the further steps of:
    - c) providing a cryogenic bath of a third refrigerating fluid in a storage area;

- d) cooling the third refrigerating fluid to a third predetermined temperature lower than the temperature of the first refrigerating fluid by means of said second fluid; and
- e) cooling the first refrigerating fluid by means of the third refrigerating fluid stored in the cryogenic bath.
41. (New) A method according to claim 40, wherein the third refrigerating fluid is cooled to an intermediate temperature between the temperature of the first and second refrigerating fluids.

#### REMARKS

The claims have been amended to eliminate improper multiple claim dependency and conform them to U.S. practice. Claims 21-41 are pending in this application. No new matter has been introduced by these amendments.

The examiner is respectfully requested to consider the above preliminary amendment prior to examination of the application.

If there are any fees due in connection with the filing of this amendment, please charge the fees to Deposit Account No. 06-0916. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our deposit account.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: January 28, 2002

By: 

Ernest F. Chapman  
Reg. No. 25,961

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ERNEST F. CHAPMAN  
(202) 408-4096

January 28, 2002

ATTORNEY DOCKET NO.: 05788.0207  
CUSTOMER NUMBER: 22,852

**Box Patent Application**  
**Assistant Commissioner for Patents**  
**Washington, D.C. 20231**

New U.S. Patent Application

Title: SYSTEM FOR TRANSMITTING ELECTRIC ENERGY IN  
SUPERCONDUCTIVITY CONDITIONS AND METHOD FOR  
REFRIGERATING IN CONTINUOUS A SUPERCONDUCTING CABLE

being a Continuation of PCT International

Application No. PCT/EP00/06877 filed July 19, 2000

Inventors: 1) Massimo BECHIS      Addresses: 1) Dusino San Michele (AT), Italy  
2) Marco NASSI                      2) Torino, Italy

Dear Sirs:

We enclose the following papers for filing in the United States Patent and Trademark Office under 35 U.S.C. 111(a) as a **Continuation** application of PCT International Application No. PCT/EP00/06877 filed July 19, 2000 which claimed priority of European Patent Application No. 99114604.4. filed July 26, 1999 and the benefit of U.S. Provisional Application No. 60/145,838, filed July 27, 1999.

1. Application 29 pages, including 3 independent claims and 22 claims total option (as amended).
2. Preliminary Amendment.
3. Drawings 5 sheets of drawings containing 5 figures..
4. Information Disclosure Statement and Information Disclosure Citation, PTO 1449 with documents attached.
5. Copy cover page WIPO Publication No. WO 01/08171 A1.
6. The filing fee is calculated as follows:

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Basic Application Filing Fee					\$740	\$740.00
	Number of Claims		Basic	Extra Claims		
Total Claims	22	-	20	2	x \$18	36.00
Independent Claims	3	-	3		x \$84	
X Presentation of Multiple Dep. Claim(s)					+\$280	280.00
Subtotal						\$ 1056.00
Reduction by ½ if small entity						-
TOTAL APPLICATION FILING FEE						\$ 1056.00

7. A check for \$1056.00 is enclosed. The fee includes:

\$740.00 filing fee;

\$316.00 additional claims fee; and

Applicants claim the right to priority based on European Patent Application No. 99114604.4, filed July 26, 1999 and the benefit of U.S. Provisional Application No. 60/145,838, filed July 27, 1999.

This application is being filed under the provisions of 37 C.F.R. § 1.53(f). Applicants await notification from the Patent and Trademark Office of the time set for filing the Declaration.

Please address all correspondence with respect to this application to:

Finnegan, Henderson, Farabow,  
Garrett & Dunner, L.L.P.  
1300 I Street, N.W.  
Washington, D.C. 20005-3315

Please accord this application a serial number and filing date.

The Commissioner is hereby authorized to charge any additional filing fees due and any other fees due under 37 C.F.R. § 1.16 or § 1.17 during the pendency of this application to our Deposit Account No. 06-0916.

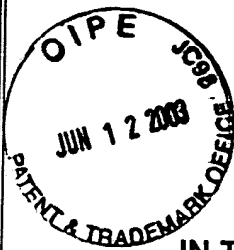
Sincerely,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

By: 

Ernest F. Chapman  
Reg. No. 25,961

EFC/bl  
Enclosures



Customer No. 22,852  
Attorney Docket No. 05788.0207

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Massimo BECHIS et al.

Serial No.: Not Yet Assigned

Filed: January 28, 2002

For: SYSTEM FOR TRANSMITTING  
ELECTRIC ENERGY IN  
SUPERCONDUCTIVITY  
CONDITIONS AND METHOD  
FOR REFRIGERATING IN  
CONTINUOUS A  
SUPERCONDUCTING CABLE

)  
)  
) Group Art Unit: Not yet assigned

) Examiner:  
)  
)

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Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

**INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§1.56 and 1.97(b), applicants bring to the Examiner's attention the document listed on attached Form PTO-1449. A copy of the listed document is attached. Applicants respectfully request that the Examiner consider the document listed on attached Form PTO-1449 and indicate that it was considered by making an appropriate notation on this form.

This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits for the above-referenced application.

The following is listed on the accompanying PTO-1449 and is in a non-English language:

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1. French Patent Publication No. 1.546.758

In lieu of a statement of relevance or translation of the non-English document, enclosed is an English-language international search report from the European Patent Office in the priority application citing this document and setting forth the relevance thereof.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that the listed document is material or constitute "prior art." If the Examiner applies the document as prior art against any claim in the application and applicants determine that the cited document does not constitute "prior art" under United States law, applicants reserve the right to present to the office the relevant facts and law regarding the appropriate status of such document. Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed document, should the document be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: January 28, 2002

By: 

Ernest F. Chapman  
Reg. No. 25,961

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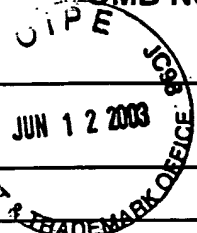
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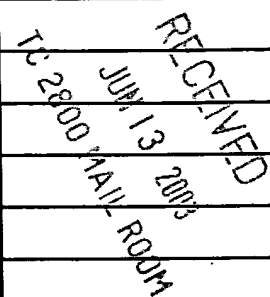
# INFORMATION DISCLOSURE CITATION

OMB No. 0651-0011

Atty. Docket No. 05788.0207	Serial No. Not yet assigned
Applicant Massimo BECHIS et al.	
Filing Date January 28, 2002	Group:



U.S. PATENT DOCUMENTS							
Examiner Initial*	Document Number	Issue Date	Name	Class	Sub Class	Filing Date If Appropriate	
	3,646,243	02/29/72	Graneau et al.				
	5,111,665	05/12/92	Ackermann				



FOREIGN PATENT DOCUMENTS							
	Document Number	Publication Date	Country	Class	Sub Class	Translation Yes or N	
	1.546.758	11/22/68	France			No	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)	

Examiner.	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	
Form PTO 1449 <span style="float: right;">Patent and Trademark Office - U.S. Department of Commerce</span>	



(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
1 February 2001 (01.02.2001)

PCT

(10) International Publication Number  
WO 01/08171 A1

(51) International Patent Classification<sup>7</sup>: H01B 12/16

(21) International Application Number: PCT/EP00/06877

(22) International Filing Date: 19 July 2000 (19.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
99114604.4 26 July 1999 (26.07.1999) EP  
60/145,838 27 July 1999 (27.07.1999) US

(71) Applicant (for all designated States except US): PIRELLI CAVI E SISTEMI S.P.A. [IT/IT]; Viale Sarca, 222, I-20126 Milano (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BECHIS, Massimo [IT/IT]; Corso Industria, 16, I-14010 Dusino San Michele (IT). NASSI, Marco [IT/IT]; Via Cibrario, 36 bis, I-10144 Torino (IT).

(74) Common Representative: PIRELLI CAVI E SISTEMI S.P.A.; Viale Sarca, 222, I-20126 Milano (IT).

(81) Designated States (national): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

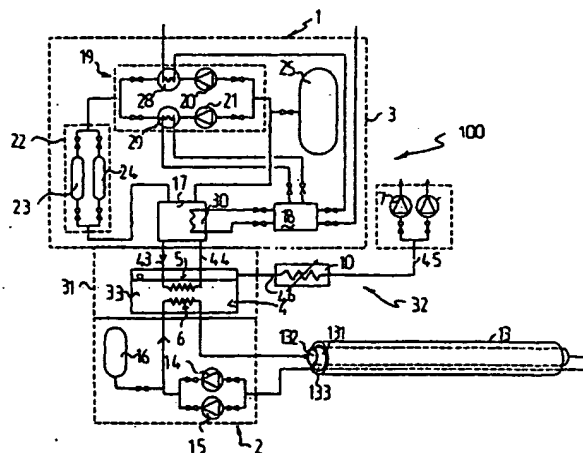
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM FOR TRANSMITTING ELECTRIC ENERGY IN SUPERCONDUCTIVITY CONDITIONS AND METHOD FOR REFRIGERATING IN CONTINUOUS A SUPERCONDUCTING CABLE



(57) Abstract: A system (100) for transporting electric energy in superconductivity conditions is described, which comprises a superconducting cable (13) including superconducting material, and a cryogenic plant (1) for cooling said superconducting cable (13) below the critical temperature of said material, comprising: a) a circuit (2) for circulating a first refrigerating fluid having a first predetermined temperature lower than the critical temperature of the superconducting material, from and to the superconducting cable (13); b) a refrigerating circuit (3) for cooling a second refrigerating fluid to a second predetermined temperature lower than the temperature of the first refrigerating fluid; c) a heat exchange unit (31) for effecting a heat exchange between said first and second refrigerating fluids, which is characterized in that said heat exchange unit (31) is provided with a storage unit (4) of a third refrigerating fluid having a third predetermined temperature lower than the temperature of the first refrigerating fluid and being in heat exchange relationship with said first and second fluids.

WO 01/08171 A1

ASS/

**PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:**

In Re Application of: Massimo BECHIS et al.

Serial No.: 10/056,021

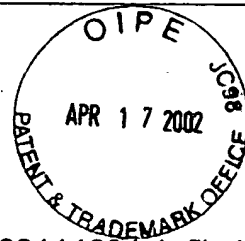
Filed: January 28, 2002

For: SYSTEM FOR TRANSMITTING ELECTRIC ENERGY IN SUPERCONDUCTIVITY  
CONDITIONS AND METHOD FOR REFRIGERATING IN CONTINUOUS A  
SUPERCONDUCTING CABLE



**BOX MISSING PART**

1. Check for \$130.00
2. Response To Notice To File Missing Parts
3. Copy of Notice To File Missing Parts
4. Declaration and Power of Attorney
5. Claim For Priority
6. Certified copy of European Patent Application No. 99114604.4, filed July 26, 1999



Dated April 17, 2002

Docket No.: 08719.0207

(Due Date: 4/25/02)

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**PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:**

In Re Application of: Massimo BECHIS et al.

Serial No.: 10/056,021

Group Art Unit: 2831

Filed: January 28, 2002

Examiner:

For: SYSTEM FOR TRANSMITTING ELECTRIC ENERGY IN SUPERCONDUCTIVITY  
CONDITIONS AND METHOD FOR REFRIGERATING IN CONTINUOUS A  
SUPERCONDUCTING CABLE

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**BOX ASSIGNMENT**

1. Recordation Form Cover Sheet
2. Assignment to Pirelli Cavi E Sistemi S.p.A.
3. Check for \$ 40.00



Dated April 17, 2002

Case Ref.: 08719.0207

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4-19-02  
55

**EFC/FPD/peg**  
**Enclosures**



Europäisches  
Patentamt

European  
Patent Office

Office eur péen  
des brevets

Bescheinigung

Certificate

Attestation

Die angehefteten Unterlagen stimmen mit der ursprünglich eingereichten Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.

The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr. Patent application No. Demande de brevet n°

99114604.4

Der Präsident des Europäischen Patentamts;  
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets  
p.o.

R C van Dijk